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EXAMINER

PATEL, NITIN C

ART UNIT PAPER NUMBER

2116

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,917

Applicant(s)

MIZUYABU ET AL.

Examiner

Nitin C. Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 20-27 and 34-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-19 and 28-32 is/are rejected.
- 7) ☒ Claim(s) 9 and 33 is/are objected to.
- 8) ☒ Claim(s) 20-27 and 34-41 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is in responsive to amendments filed on 13 May 2005.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-19 and 28-33, drawn to frame rate control/alteration for display, classified in class 713, subclass 600, and 300.
- II. Claims 20-27 and 34-41, drawn to number of bits of display data to represent color information, classified in class 345, subclass 589.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention Group II has separate utility such as number of bits of display data to represent color information. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

The claims of Group II are directed to an invention that is independent or distinct from the invention originally claimed as set forth above.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 20-27 and 34-41 are withdrawn from

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consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 – 17, and 28 – 33 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Cairns et al. [hereinafter as Cairns], US Patent application 2002/0027541 A1 [cited in previous office action].

3. As to claim 1, Cairns discloses a method for driving active matrix LCDs comprising:

a. identifying [by data analysis] a first [n-1] display content [n-1 display data frame] to be displayed at first time;

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b. identifying [by data analysis] a second [n] display content [n display data frame] to be displayed at a second time [n], wherein the second time is after the first time [it is inherent to current data frame n that is displayed at time after the previous frame n-1];

c. providing display data to a display port [LCD] at a first frame rate [regular refresh rate], when the first display content [content of previous n-1 frame] is different from the second display content [content of current frame n]; and

d. providing display data to the display port [LCD] at a second frame rate [reduced frame rate, as for static scene display is not refreshed/skipped which inherently reduces frequency at which display is updated], when the first display content is substantially the same as the second display content, wherein the second frame rate is less than the first frame rate [para 0019, 0021 – 0022, 0049 – 0051, 0057 – 0065, and 0068 on page 3 – 4, and 6 – 7].

4. As to claim 28, Cairns discloses a system comprising:

a. a content [data] analyzer [26, a data analysis means] to compare [by comparator 60] a first display content to be displayed at a first time with a second display content to be displayed at a second time, wherein the second time is after the first time;

b. a display module [LCD controller] to alter [to control] a frame rate [frequency at which information is updated on LCD] for providing display data to a display port [LCD], wherein said frame rate is based on the comparison performed by said content [data] analyzer [26, analysis means]; and

c. said display port [LCD] to output said display data [para 0057 – 0065, and 0068 on page 3 – 4, and 6 – 7].

5. As to claim 5, Cairns teaches to represent the display data [frame of image data] using a first number of bits [signature], when the first display content is different from the second display content [when two successive signatures are identical representing that a static scene]; and representing the display data using a second number of bits, when the first display content is substantially the same as the second display content [when two successive signatures are identical representing that a static scene] wherein the second number of bits is less than the first number of bits [in the event that differences occur only in one or more LSBs] [para 0055 – 0058, on page 3, para 0060 – 0065, 0070 – 0072 on page 4, 0093 – 0100 on page 5 – 6].

6. As to claim 6, Cairns teaches the first and second number of bits associated with a color depth [brightness level] [para 0012 – 0017, 0071 – 0072, 0093 – 0097 on page 5, figs. 5 – 6, 10 - 15].

7. As to claims 10 - 12, Cairns discloses a display port [LCD], which can be used in association with different types of data processing devices including portable device, and personal digital assistant [para 0009, on page 1].

8. As to claims 13 - 15, Cairns discloses a display data for output on a display device [liquid crystal display [LCD]], which can be used in including portable device, and personal digital assistant [para 0009, on page 1].

9. As to claims 16, and 32, Cairns discloses the steps of supporting a first nominal power [normal power consumption], when the first display content is different from the

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second display content, and supporting a second nominal power [reduced power consumption], when the first display content is substantially the same as the second display content, wherein the second nominal power is less than the first nominal power [para 0021 – 0022 on page 2, claims 7, 17, 30].

10. As to claims 17 - 19, Cairns discloses device [mobile phone, PDA] and method of reducing power consumption in displaying a sequence of digital images with multi-format [multimedia] including video and audio data [para 0009, 00013 on page 1].

11. As to claim 30, Cairns discloses that display content is stored in memory [SRAM] [para 0007 on page 1].

12. Claims 1 – 17, and 28 – 33 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Honda et al. [hereinafter as Honda], US Patent application 6,493,466 B1.

13. As to claim 1, Honda discloses a method for image data compression and expansion and image transmission system comprising:

a. identifying a first display content [first image which is a reference image] to be displayed at first time [first image is inherently displayed at first time];

b. identifying a second display content [second image] to be displayed at a second time, wherein the second time is after the first time [it is inherent to successive images that second time is after the first time] [col. 9, lines 33 – 41];

c. providing display data [image data] to a display port [Display] at a first [increased] frame rate [frame rate controlled by frame rate control means], when the first display content [first image] is different [change] from the second display content

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[second image] [detected by image change detection means] [col. 2, lines 63 – 65, col. 8, lines 29 – 50, col. 9, lines 13 – 17, 25 – 65]; and

d. providing display data [image data] to the display port [Display] at a second frame rate [col. 3, lines 60 - 63], when the first display content is substantially the same as the second display content, wherein the second frame rate is less than the first frame rate [Abstract, col. 2, lines 44 – 56, lines 63 – 65, col. 4, lines 1 – 16, col. 7, lines 29 55, col. 8, lines 29 – 50, col. 9, col. 9, lines 33 – 65].

14. As to claim 28, Honda discloses a system comprising:

a. a content [data] analyzer [image change detection means] to compare [by comparator 60] a first display content [first image which is a reference image] to be displayed at a first time [first image is inherently displayed at first time] with a second display content [second image] to be displayed at a second time [second image is inherently displayed at second time], wherein the second time is after the first time [it is inherent to successive images that second time is after the first time] [col. 9, lines 33 – 41];

b. a display module [frame rate control means] to alter [to change] a frame rate for providing display data to a display port [LCD], wherein said frame rate is based on the comparison performed by said content analyzer [col. 4, lines 1 – 16, col. 8, lines 29 – 32, col. 9, lines 60 - 63]; and

c. said display port [1204, Display, fig. 12] to output said display data [Abstract, col. 2, lines 44 – 56, lines 63 – 65, col. 4, lines 1 – 16, col. 7, lines 29 55, col. 8, lines 29 – 50, col. 9, col. 9, lines 33 – 65, fig. 1 - 20].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 2 – 4, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cairns et al. [hereinafter as Cairns], US Patent application 2002/0027541 A1 [cited in previous office action] as applied to claims 1, and 28 above, and further in view of Mirov et al. [hereinafter as Mirov], US Patent 6,691,215 B1 [cited in previous office action].

16. As to claims 2, and 31, Cairns discloses a method for driving active matrix LCDs comprising: identifying [by data analysis] a first [n-1] display content [n-1 display data frame] to be displayed at first time; identifying [by data analysis] a second [n] display content [n display data frame] to be displayed at a second time [n], wherein the second time is after the first time [it is inherent to current data frame n that is displayed at time after the previous frame n-1]; providing display data to a display port [LCD] at a first frame rate [regular refresh rate], when the first display content [content of previous n-1 frame] is different from the second display content [content of current frame n]; and providing display data to the display port [LCD] at a second frame rate [reduced frame rate, as for static scene display is not refreshed/skipped which inherently reduces frequency at which display is updated], when the first display content is substantially the same as the second display content, wherein the second frame rate is less than the first

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frame rate [para 0019, 0021 – 0022, 0049 – 0051, 0057 – 0065, and 0068 on page 3 – 4, and 6 – 7].

However, Cairns does not teach to use the comparison result and outputs for enabling first clock rate when the first display content is different from the second display content, and enabling second clock rate when the first display content is substantially same as the second display content, wherein the second clock rate is less than the first clock rate.

Mirov discloses an apparatus and method for enabling a first clock rate [enabling PLL] and second clock rate [disabling PLL] using multiplexer [1010, fig. 1] based on the select signal [PLL BYPASS] wherein second clock rate [PLL disabled] is less than the first clock rate [col. 4, lines 43 - 67, col. 6, lines 49 - 67, col. 7, lines 1 - 20, col. 8, lines 65 - 67, col. 9, lines 1 - 14, col. 13, lines 14 - 52, col. 15, lines 64 - 67, col. 16, lines 1 - 67, col. 17, lines 1 - 5, fig. 10].

It would have been obvious to one of ordinary skill in the art, having the teachings of Cairns and Mirov before him at the time of invention was made, to modify the frame rate control based on comparison with control signal output as disclosed by Cairns to include enabling a first clock rate [enabling PLL] and enabling second clock rate [disabling PLL] based on selection signal [PLL-BYPASS] as taught by Mirov, in order to obtain a system that track and record the information on an hourly, daily, weekly, monthly, etc. basis and recorded information is periodically analyzed to identify activity trends and may then be used to modify the rate at which system is allowed to transition between the normal, reduced power, and idle modes [col. 25, lines 14 – 28].

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17. As to claim 3, Mirov discloses providing a clock signal associated with an Oscillator to a phase locked loop and a locked signal generated by the phased locked loop [fig. 5, 10].

18. As to claim 4, Mirov discloses disabling the phased locked loop [with PLL BYPASS] and providing the clock signal associated with the oscillator [VCO] [fig. 5, 10].

19. Claim 6, is rejected under 35 U.S.C. 103(a) as being unpatentable over Cairns et al. [hereinafter as Cairns], US Patent application 2002/0027541 A1 [cited in previous office action] as applied to claims 1, and 28 above, and further in view of Nakagiri, US Patent 6,396,465 B1.

20. As to claims 6, Cairns discloses a method for driving active matrix LCDs comprising: identifying [by data analysis] a first [n-1] display content [n-1 display data frame] to be displayed at first time; identifying [by data analysis] a second [n] display content [n display data frame] to be displayed at a second time [n], wherein the second time is after the first time [it is inherent to current data frame n that is displayed at time after the previous frame n-1]; providing display data to a display port [LCD] at a first frame rate [regular refresh rate], when the first display content [content of previous n-1 frame] is different from the second display content [content of current frame n]; and providing display data to the display port [LCD] at a second frame rate [reduced frame rate, as for static scene display is not refreshed/skipped which inherently reduces frequency at which display is updated], when the first display content is substantially the same as the second display content, wherein the second frame rate is less than the first

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frame rate [para 0019, 0021 – 0022, 0049 – 0051, para 0055 – 0058, on page 3, para 0060 – 0065, 0068, 0070 – 0072 on page 4, 0093 – 0100 on page 5 – 7].

However, Cairns does not teach representing the display data using a first and second number of bits associated with color depth.

Nakagiri teaches device and method for display device with frame rate controlling sections to supply display data to driving circuit in a LCD [Liquid Crystal Display] associated with color depth [col. 6, lines 1 – 67, col. 7 through col. 9].

It would have been obvious to one of ordinary skill in art, having the teachings of Cairns and Nakagiri before him at the time of invention was made, to modify the LCD controller with frame rate control as disclosed by Cairns to include frame rate controlling section to supply display data to driving circuit based on a color depth information as taught by Nakagiri, in order to obtain a display device and method of displaying gray shade with simplified configuration and reducing power consumption and related costs and allowing values of products using the device and method to be maintained high [col. 3, lines 63 – 67, col. 4, lines 1 – 67, col. 5, lines 1 – 13, col. 6, lines 9 - 22].

21. Claims 7 - 8, are rejected under 35 U.S.C. 103(a) as being unpatentable over Cairns et al. [hereinafter as Cairns], US Patent application 2002/0027541 A1 [cited in previous office action] as applied to claims 1, and 28 above, and further in view of Koyama et al. [hereinafter as Koyama], US Patent 6,614,418 B1 [cited in previous office action].

22. As to claim 7, Cairns discloses a method for driving active matrix LCDs comprising: identifying [by data analysis] a first [n-1] display content [n-1 display data

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frame] to be displayed at first time; identifying [by data analysis] a second [n] display content [n display data frame] to be displayed at a second time [n], wherein the second time is after the first time [it is inherent to current data frame n that is displayed at time after the previous frame n-1]; providing display data to a display port [LCD] at a first frame rate [regular refresh rate], when the first display content [content of previous n-1 frame] is different from the second display content [content of current frame n]; and providing display data to the display port [LCD] at a second frame rate [reduced frame rate, as for static scene display is not refreshed/skipped which inherently reduces frequency at which display is updated], when the first display content is substantially the same as the second display content, wherein the second frame rate is less than the first frame rate [para 0019, 0021 – 0022, 0049 – 0051, para 0055 – 0058, on page 3, para 0060 – 0065, 0068, 0070 – 0072 on page 4, 0093 – 0100 on page 5 – 7].

However, Cairns display driver does not teach in detail to activate a first and second number of interface lines associated with display port depending upon the first display content is different or substantially same as the second display content.

Koyama discloses a device and display method of controlling image re-writing frequency [refresh rate] with refresh pulse only when two signals are different and forcibly re-write one per several frames even if no changes occurs [substantially same] in image information [col. 2, lines 1 – 63, col. 6, lines 28 – 67, col. 7, lines 1 – 62, fig. 11].

It would have been obvious to one of ordinary skill in art, having the teachings of Cairns and Koyama before him at the time of invention was made, to modify the LCD

controller with frame rate control as disclosed by Cairns to include frame rate controlling section to supply display data to driving circuit with refresh pulse only when two signals are different and forcibly re-write one per several frames even if no changes occurs [substantially same] in image information as taught by Koyama, in order to obtain a display device and method of displaying with reducing power consumption by making frequency of rewriting as low as possible [col. 1, lines 64 – 67] and avoiding deterioration of display characteristics by regular rewriting [col. 2, lines 31 – 43].

23. **Examiner's note:** Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant.

Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

24. **Prior Art not relied upon:** Please refer to the references listed in attached PTO-892, which, are not relied upon for claim rejection since these references are relevant to the claimed invention.

Response to Arguments

25. Applicant's arguments with respect to claims 1, and 29 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

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26. Claims 9, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin C. Patel whose telephone number is 571-272-3675. The examiner can normally be reached on 6:45 am - 5:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne H. Browne can be reached on 571-272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nitin C. Patel
June 8, 2005


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